


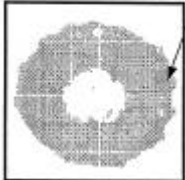




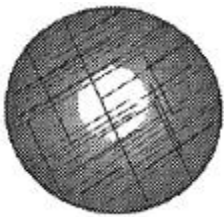



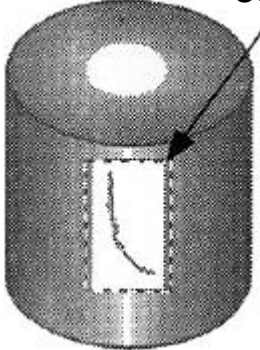

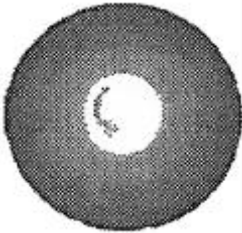
## APPENDIX A

### FIBER ENDFACE INSPECTION CRITERIA AFTER POLISHING

## BARE FIBER - BACK-LIT

<b>PERFECT FIBER</b>	<p style="text-align: center;">Top View</p>  <p style="text-align: center;">Photo Image</p> 	<b>ACCEPTABLE</b> <p>Accept. Free from cracks, scratches, edge chips, hackles, pits and other anomalies and core is clearly discerned.</p>
<b>EDGE CHIPS</b>	<p style="text-align: center;">Top View</p>  <p style="text-align: center;">Photo Image</p> 	<b>ACCEPTABLE</b> <p>Acceptable if chip maximum dimension <math>\leq 3\%</math> of fiber diameter and number of chips <math>\leq 3</math>.</p>
<b>HACKLE</b>	<p style="text-align: center;">Top View</p>  <p style="text-align: center;">Photo Image</p> 	<b>REJECT</b> <p>Surface irregularity due to improper cleaving.</p> <p>Reject/re-cleave.</p> <p>Reject for splice connection.</p> <p>May be fixable by polishing if used in connector.</p>

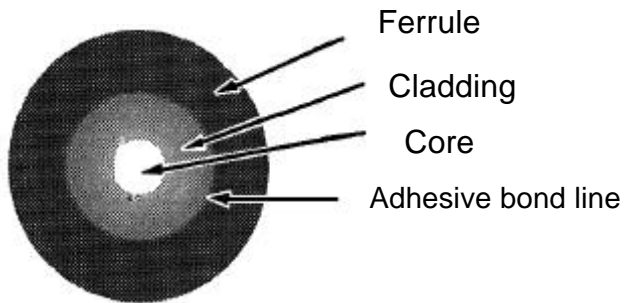
## BARE FIBER - BACK-LIT - continued

<b>SCRATCHES</b>	<p style="text-align: center;">Top View</p>  <p style="text-align: center;">Photo Image</p> 	<p style="text-align: center;"><b>REJECT</b></p> <p>Reject/Repolish.</p> <p>Reject if performance is affected.</p>
<b>CRACK</b>	<p style="text-align: center;">Top View</p>  <p style="text-align: center;">Photo Image</p> 	<p style="text-align: center;"><b>REJECT</b></p> <p>Any cracks are rejectable.</p>
<b>CRACK (Below Surface)</b>	<p style="text-align: center;">Oblique View</p>  <p style="text-align: center;">Cut Away View</p>  <p style="text-align: center;">Top View</p> 	<p style="text-align: center;"><b>REJECT</b></p> <p>Any cracks are rejectable.</p> <p>Most often only detected by back-lit operation.</p>

## FIBER IN FERRULE BACK-LIT

### PERFECT FIBER

Top View



### ACCEPT

Free from cracks, scratches, voids in the adhesive bond, and other anomalies; and concentric within the performance requirements.

### SURFACE PITS

Top View

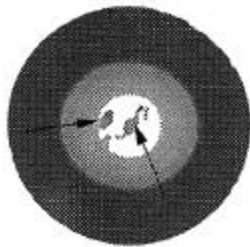
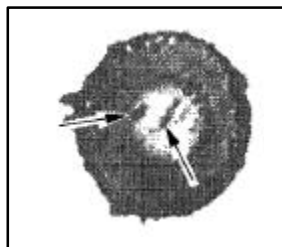


Photo Image



### REJECT

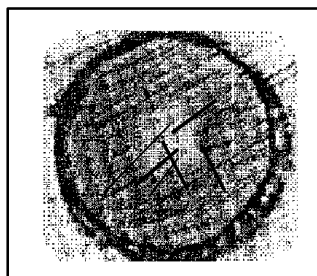
Reject/Repolish if in core or cladding.

### SCRATCHES

Top View




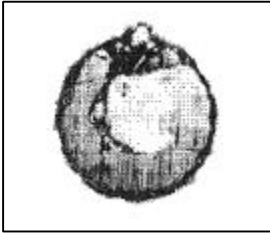

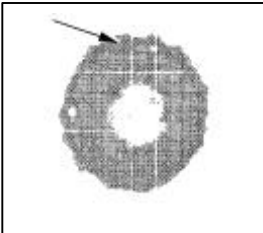
Photo Image



### REJECT

Reject/Repolish if in core.

## FIBER IN FERRULE - BACK-LIT - continued

<div data-bbox="134 180 256 218" data-label="Section-Header"> <b>CRACK</b> </div> <div data-bbox="212 298 360 340" data-label="Caption"> <p>Top View</p> </div>  <div data-bbox="505 298 699 340" data-label="Caption"> <p>Photo Image</p> </div>  <p data-bbox="492 642 740 667">*Ferrule not visible in photo</p>	<div data-bbox="821 180 959 218" data-label="Section-Header"> <b>REJECT</b> </div> <p data-bbox="894 428 997 466">Reject.</p>
<div data-bbox="134 699 337 737" data-label="Section-Header"> <b>EDGE CHIPS</b> </div> <div data-bbox="212 852 360 894" data-label="Caption"> <p>Top View</p> </div>  <div data-bbox="513 852 704 894" data-label="Caption"> <p>Photo Image</p> </div>  <p data-bbox="513 1188 764 1213">*Ferrule not visible in photo</p>	<div data-bbox="821 699 959 737" data-label="Section-Header"> <b>REJECT</b> </div> <p data-bbox="821 947 1179 984">May be fixable by polishing.</p>

## FIBER IN FERRULE - DIRECT-LIT, NO CORE ILLUMINATION

### PERFECT

Top View

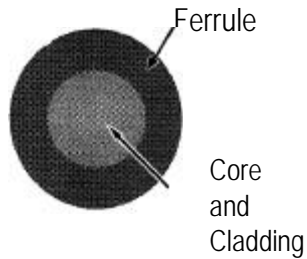
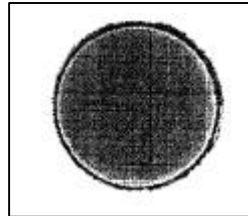


Photo Image



\* Ferrule not visible in photo

### ACCEPT

Free from cracks, scratches, edge chips, hackles, pits, and other anomalies; and concentric within the performance requirements.

Note: Cracks may be invisible without core illumination.

### SURFACE PITS

Top View



Photo Image



\* Ferrule not visible in photo

### REJECT

Reject/Repolish if in core or cladding.

Confirm by backlighting.

### SCRATCHES

Top View



### REJECT

Reject/Repolish.

### EPOXY

Top View

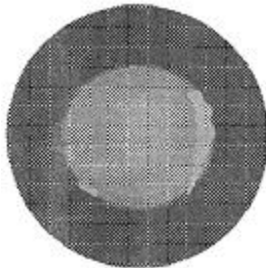
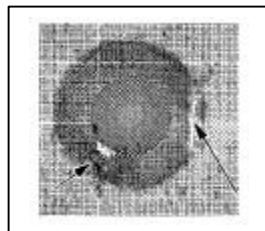


Photo Image



\* Ferrule not visible in photo

### REJECT

Reject if epoxy is on core, cladding or ferrule. May be fixable by repolishing.

## **APPENDIX B - TEST METHODS FOR THE VERIFICATION OF OPTICAL FIBER FABRICATION PROCESSES**

The following fiber optic test procedures should be considered for all optical fiber cable assemblies, splices, and/or connectors, as applicable:

EIA-455-1 (FOTP 1)	Cable Flexing for Fiber Optic Interconnection Devices
EIA-455-3 (FOTP 3)	Procedure to Measure Temperature Cycling Effects on Optical Fibers, Optical Cable, and Other Passive Fiber Optic Components.
EIA-455-4 (FOTP 4)	Fiber Optic Connector/Component Temperature Life.
EIA-455-5 (FOTP 5)	Humidity Test Procedure for Fiber Optic Connecting Devices
EIA-455-6 (FOTP 6)	Cable Retention Test Procedure for Fiber Optic Cable Interconnecting Devices
EIA-455-11 (FOTP 11)	Vibration Test Procedure for Fiber Optic Connecting Devices and Cable
EIA-455-12 (FOTP 12)	Fluid Immersion Test for Fiber Optic Components
EIA-455-13 (FOTP 13)	Visual and Mechanical Inspection of Fiber, Cables, Connectors etc.
EIA-455-14 (FOTP 14)	Fiber Optic Shock Test (Specified Pulse)
EIA-455-15 (FOTP 15)	Altitude Immersion
EIA-455-16 (FOTP 16)	Salt Spray
EIA-455-17 (FOTP 17)	Maintenance Aging of Fiber Optic Connectors and Terminated Cable Assemblies
EIA-455-21 (FOTP 21)	Mating Durability for Fiber Optic Interconnecting Devices
EIA-455-25 (FOTP 25)	Repeated Impact Testing of Fiber Optic Cables and Cable Assemblies
EIA-455-26 (FOTP 26)	Crush Resistance of Fiber Optic Interconnecting Devices
EIA-455-33 (FOTP 33)	Fiber Optic Cable Tensile Loading and Bending Test
EIA-455-34 (FOTP 34)	Interconnection Device Insertion Loss Test
EIA-455-36 (FOTP 36)	Twist Test for Fiber Optic Connecting Devices
EIA-455-37 (FOTP 37)	Low or High Temperature Bend Test for Fiber Optic Cable
EIA-455-39 (FOTP 39)	Fiber Optic Cable Water Wicking Test
EIA-455-41 (FOTP 41)	Compressive Loading Resistance of Fiber Optic Cables
EIA-455-42 (FOTP 42)	Optical Crosstalk in Fiber Optic Components

EIA-455-53 (FOTP 53)	Attenuation by Substitution Measurement for Multi-mode Graded-Index Optical Fibers or Fiber Assemblies Used in Long Length Communication Systems
EIA-455-57 (FOTP 57)	Optical Fiber End Preparation and Examination
EIA-455-59 (FOTP 59)	Measurement of Fiber Point Defects using an Optical Time Domain Reflectometer
EIA-455-60 (FOTP 60)	Measurement of Fiber or Cable Length Using an OTDR
EIA-455-61 (FOTP 61)	Measurement of Fiber or Cable Attenuation Using an OTDR
EIA-455-62 (FOTP 62)	Measurement of Optical Fiber Macrobend Attenuation
EIA-455-69 FOTP 69)	Test Procedure for Evaluation of the Effect of Minimum and Maximum Exposure Temperatures on the Optical Fiber
EIA-455-85 (FOTP 85)	Fiber Optic Cable Twist Test
EIA-455-88 (FOTP 88)	Fiber Optic Cable Bend Test
EIA-455-91 (FOTP 91)	Fiber Optic Cable Twist-Bend Test
EIA-455-95 (FOTP 95)	Absolute Optical Power Test for Optical Fibers and Cables
EIA-455-96 (FOTP 96)	Fiber Optic Cable Long-Term Storage Temperature Test for Extreme Environments
EIA-455-98 (FOTP 98)	Fiber Optic Cable External Freezing Test
EIA-455-171 (FOTP 171)	Attenuation by Substitution Measurement for Short-Length Multi-mode Graded-Index and Single-Mode Optical Fiber Cable Assemblies
NRL/MR/6505-92-6963	Procedure for Measuring Radiation-Induced Attenuation in Optical Fibers and Optical Cables

**NASA TECHNICAL STANDARD IMPROVEMENT PROPOSAL**

(See Instructions - Reverse Side)

1. DOCUMENT NUMBER		2. DOCUMENT TITLE	
3. NAME OF SUBMITTING ORGANIZATION			
4. ADDRESS (Street, City, State, ZIP Code)			
5. PROBLEM AREAS			
a. Paragraph Number and Wording			
b. Recommended Wording:			
c. Rational for Recommendation:			
6. REMARKS			
7. NAME OF SUBMITTER		8. TELEPHONE NO.	
		9. DATE	

## INSTRUCTIONS

In a continuing effort to improve our NASA Technical Standards, we invite all holders to use this form for submitting comments and suggestions for improvements. All users of NASA documents are invited to provide suggestions. The form may be detached and mailed. In block 5, be as specific as possible about particular problem areas, such as wording changes, which would alleviate the problems. Enter in block 6 any remarks not related to a specific paragraph of the document. An acknowledgment will be mailed to the submitter within 30 days. Supporting data should accompany any recommendations for changes.

**NOTE: THIS FORM MAY NOT BE USED TO REQUEST COPIES OF DOCUMENTS, NOR TO REQUEST WAIVERS, DEVIATIONS, OR CLARIFICATION OF STANDARD REQUIREMENTS ON CURRENT CONTRACTS. COMMENTS SUBMITTED ON THIS FORM DO NOT CONSTITUTE OR IMPLY AUTHORIZATION TO WAIVE ANY PORTION OF THE REFERENCED DOCUMENT(S) OR TO AMEND CONTRACTUAL REQUIREMENTS.**

Proposals may be submitted to:

NASA Technical Standards Coordinator  
NASA Headquarters  
Code QS  
Washington, DC 20546